I. INTRODUCTION

1. The United Nations Water Conference (UNWC) convened at Mar del Plata, Argentina, in 1977 was the first global meeting on water at a very high policy-making level. It recognized that effective and efficient management of water resources with a basic framework for its development, protection, utilization and management can contribute significantly towards improving the national economic and social conditions. All Member States of the United Nations approved and recommended the implementation of the Action Plan comprehensively known as the Mar del Plata Action Plan (MPAP). (1)

2. Since 1977, efforts have been made to implement this Action Plan at the national and regional levels in Africa with the support of the international community. Subsequently various reports were prepared by the Economic Commission for Africa (ECA) to apprise governments on progress and problems encountered in the implementation process.

3. This present report dwells on the progress or lack thereof in the development of the water sector within the framework of MPAP at the end of this past decade. It also provides information on the future outlook and on the lessons learnt as situations unfolded new experiences. More importantly, it points to the challenges in the 1990s and beyond. In this regard it outlines the general direction and identifies the main steps necessary for achieving a higher rate of progress in the implementation of MPAP during 1990s and beyond.

4. The information and data used for this report are drawn from numerous sources provided by governments, the United Nations system of organizations as well as by other bodies to ECA. Some of the recent studies prepared in this respect cover only a partial population of Africa and the assumption/projection was needed to extend it to get the regional picture. Wherever possible these data and information are supplemented by those procured from surveys and mission findings.

5. The report has three parts. Part I is the introduction, part II contains appraisal of activity areas and related issues of concern. This part provides the regional picture regarding the current state of development, the problems encountered and the outlook for the future. In part III is the strategy and action proposals for the 1990s are outlined. The secretariat invites review of and comments on this document by the meeting and will appreciate guidelines for future actions in this regard.

II. APPRAISAL OF WATER DEVELOPMENT ACTIVITIES

A. Drinking Water Supply and Sanitation

Review and appraisal

6. In November 1980, the General Assembly proclaimed the period 1981-1990 as the International Drinking Water Supply and Sanitation Decade (IDWSSD) during which member States would make commitment to bring about sustainable improvement in the standards and levels of service in drinking water supply and sanitation for their people by the year 1990. In assessing the Decade it can be cited that impressive numbers of people were served. It can also be underscored that at the end of the Decade results have fallen short of expectations. In efforts to meet the

objectives and goals set during the Decade, each country was moving at different paces. The progress made is therefore, measured on the basis of the overall impact to reflect the regional picture.

7. The latest available evaluation of the progress in achieving the goals of IDWSSD was by WHO in 1988. (2) By the end of 1988, an additional 40 million urban residents in the African region were supplied with adequate and safe water supply, while 52 million were provided with appropriate sanitation. These additional supplies brought the percentage coverage of urban water supply and of sanitation to 77 per cent (93.667 million) and to 79 per cent (96.100 million) respectively. For the rural areas an additional 87 million people were supplied with good drinking water and another 1 million people were provided with sanitation facilities. These achievements brought the rural coverages to 26 per cent (88.573 million) and 17 per cent (57.913 million) respectively for water supply and sanitation.

8. The estimated coverage by 1990 for urban water supply was 77 per cent (103.806 million) maintaining the same percentage as was in 1988 and for urban sanitation it was 80 per cent (108.967). By the same period rural water supply was expected to increase slightly in percentage terms to 27 per cent (95.327 million) and while sanitation coverage was likely to reduce to 16 per cent. ECA estimates that the present annual rate of coverage is only 25 per cent and 18 per cent of the rates required to achieve the objectives of the IDWSSD (100 per cent coverage) for drinking water supply and sanitation respectively in the urban areas of Africa by 2000. In the case of rural areas the present annual rate of progress is only 16 per cent and 0.5 per cent of the rates required to achieve the objectives for water supply and sanitation respectively by year 2000. (3) There is therefore a considerable amount of unfinished business which must engage the attention of Governments in the 1990s and beyond.

9. The conclusion that can be derived is that, in the urban areas the effort in water supply and sanitation has been keeping balance while in rural areas the sanitation sector has been neglected. The situation in rural areas is disconcerting since the rate of achievement is low and worsening. The net result has been that the unserved population has been on the increase.

10. A number of factors are responsible for impeding progress. The question of financial resources continues to be one of the serious constraints. Partly as a result of Structural Adjustment Programmes, government expenditures in social services have been reduced. Consequently national budgets of the African countries are less able to support the sectoral investment needed. External investment funds have also been reduced, because of the debt burden which the countries are finding difficult to service. Systems which depend upon central government subsidies to meet their operation and maintenance costs have had these already inadequate subsidies either reduced or completely removed.

Prospects and issues

11. The achievement in drinking water supply and sanitation during the Decade has been painfully disappointing due mainly to natural and man-made hazards as well as demographic pressures and internal and external economic and political environments. Projections of current trends indicate that Africa will continue to suffer from these consequences. The widening gap of the unserved population will have serious health and environmental impacts that would preclude the attainment of desired living conditions. The situation in urban areas, particularly in large cities could be

alarming. The increase in population in 31 cities in Africa over the next decade is expected to be in the order of 22.5 million. As a result, in relative terms, Africa particularly sub-Saharan Africa would fall short of progress anticipated in other regions and they would be worse off by the end of the century than they were at the start of 1980. Clearly the target of providing clean water and sanitation for all even by year 2000 will be very difficult to reach.

12. There is a strong possibility that countries will choose those most easily served to be served first. The experience in rural areas has been to serve larger communities and leave dispersed population until later. In urban areas the bulk of the work to be done is in the difficult peri-urban areas. In the early years of the coming decade, there will be a lag as governments adjust to their new target groups even though water supply and sanitation for the unserved population of the rural and urban communities will remain priority areas up to the years 2000 and 2010.

13. The future strategy should be based on establishing realistic targets by governments, promoting population and family planning policies, adopting low-cost technologies, introducing cost-sharing mechanisms by means of tariff policies, increasing community participation particularly of women in rural areas where the need is greatest, ensuring that drinking water and sanitation programmes take place in the context of national planning and are integrated within the framework for environment and sustainable development. Privatization of the maintenance and operation of water supply systems and orientation to the rural sector in the package for rural development programmes is perceived as a sound approach ensuring sustainability.

14. Two important events have taken place to build up the momentum as the end of the IDWSSD and the 1990s dawned. One of these was the Global Consultation held in New Delhi, India, from 10 to 14 September 1990. (4) From the statement issued at the end of the consultations, four guiding principles emerged for the United Nations organizations, international community and non-governmental organizations to intensify their efforts based on the: (i) protection of the environment and safeguarding health through integrated management of water resources and liquid and solid water; (ii) institutional reforms, promoting an integrated approach including changes in procedures, attitudes and behaviour; (iii) community management of services; and (iv) sound financial practices achieved through better management of existing assets. The Consultation agreed that the sectoral challenge in the 1990s for most developing countries would be "some for all, rather than more for some". A follow-up action for the implementation of the approaches is prepared and a set of recommendations for action by governments is outlined.

15. The second event was the African Water Supply and Sanitation Sector Conference held in Abidjan, Côte d'Ivoire, on 10 and 11 May 1990. (5) From this Conference emerged a statement known as the "Abidjan Accord" that endorsed the agreement contained in an annex entitled "Guidelines for the Development of Country Strategies for the 1990s". The annex comprehensively elaborated on the principles for strategy formulation and the actions required to implement it.

16. The new strategies and fresh approaches as well as the stronger commitment by the world community to support the implementation of water supply and sanitation programmes in Africa injects a new hope for better attainment of goals. This momentum with the intensified efforts by African Governments will obviously bring in positive changes in the realization of sector programmes in the 1990s and beyond.

B. Water and agriculture

Review and appraisal

17. Resolution III of the MPAP recognized the enormous deficit of food and other agricultural productions and called for measures that would cover a wide spectrum of activities and outlined a specific "Action Programme on Water for Agriculture." Particular attention was drawn to land and water management both under irrigated and rainfed cultivation with due regard to long-term as well as short-term productivity. (1)

18. Despite overall improvements, serious food problems persisted in Africa for over two decades since 1970. Food production under rainfed conditions rose at 1.4 per cent per annum in the period 1970-1980 against estimated population growth rate of 3 per cent per annum. (6) It was at its worst in 1983 and 1984, showing a decline of 0.8 and 0.4 per cent respectively. Severe set-backs prevailed in Southern Africa and in the Sahel with a decline reaching 10 and 11 per cent respectively in 1983/1984. In Central Africa, a low growth rate of about 1.6-1.7 per cent a year occurred during 1983-1985. (7)

19. With 93.5 per cent of the cultivated area under rainfed conditions the annual fluctuations in the size of African food and agricultural production can largely be attributed to the variability in the rainfall regime. This has been amply demonstrated since the recovery. In 1985, there was a marked increase in regional recovery in food production of 10 per cent. This was followed by a further increase of 4 per cent in 1986. But 1987 again agricultural output increased by only 0.5 per cent. All the subregions were reported to have performed poorly during the year. The poor harvests were due to prolonged dry spells and unusually late rains. (8) Aside from unreliability of rainfall, was population pressure which often forced farmers to work on shrinking farms and marginal lands to maintain household income. This problem has been increasingly felt over the last 30 years when a corresponding decrease occurred in land availability.

20. In the case of food production, cereal production in the region fell by 8 per cent in 1987. At the same time, production of pulses decreased by 5.3 per cent while that of tubers rose by a mere 1.6 per cent with cassava production stagnating at 106 million tons. The situation however was not uniform throughout the region. In North, West and Central Africa, the situation was generally satisfactory; in East Africa it was mixed whereas in the Sahel it was estimated to have been more than 70 per cent below that of the recorded production in 1986.

21. Problems of food production in Africa vary widely and individual countries need to tailor their approaches to particular requirements. Nevertheless the midst of enormous variety of ecological zones, micro-climates and soil conditions, requiring specialized crops and farming techniques, there is a distinct commonality to take policy measures to spur agricultural development aimed at: (i) increasing the role of private sector inpricing and marketing agricultural products and farm inputs, and in improving financial intermediation services to farmers; (ii) identifying and disseminating new technologies to increase productivity; (iii) improving the security of land tenure and enhancing environmental protection; (iv) developing rural infrastructure in order to strengthen rural-urban economic links and improve marketing; (v) encouraging popular participation by strengthening rural peoples and associations, including women, to play greater roles in decision-making; and (vi) promoting regional co-operation, especially in food trade and joint research.

22. FAO estimates that in 1982, Africa, south of the Sahara, irrigated some 5 million hectares. The irrigated area has been increasing at a rate of 150,000 hectares per year since the mid-1960s. Seventy per cent of the total irrigated area is concentrated in three countries: the Sudan (1,750,000 hectares), Madagascar (960,000 hectares) and Nigeria (850,000 hectares). Mali, the United Republic of Tanzania, Zimbabwe and Senegal each irrigated between 100,000 and 160,000 hectares totalling 530,000 hectares or 10 per cent. Of the total of 5 million irrigated hectares, 2.1 million hectares have been developed by governments, mostly under major modern schemes; 2.4 million hectares are irrigated using traditional methods; and the remaining 0.5 million hectares are modern private sector developments. The 5 million irrigated hectares contribute 5.3 million tons (10 per cent) to regional cereal supplies and 6 per cent to 8 per cent to supplies of roots and vegetables. According to Food Outlook (FAO) of 1989, Africa has continued to be a net importer of cereals since the rainfall recovery. Recurrent droughts have accelerated the rising trend for cereal imports to 28 million tons in 1984. (9) Hence irrigation can still contribute a lot to bring about self-sufficiency in this important item of food.

23. The regional distribution of land under irrigated agriculture remains largely unchanged since the drought, at about 9.5 million hectares, with some 50 per cent of this area in Egypt, the Sudan and Morocco. Of this area 6.1 million ha is classified as modern with the remaining 3.4 million ha constituting traditional small-scale projects. (10)

Current trends and future prospects

24. Presently emphasis seems to be on rehabilitation and expansion of old schemes which because of improper management have not made the required contribution to food production. This is particularly the case with schemes in Botswana, Burkina Faso, Ghana, Kenya and Somalia. In the North African countries particularly Egypt, considerable efforts are being made to improve irrigation efficiency in view of the current limiting water supply from the Nile River.

25. For the future, it is planned by the CILSS countries in the Sahel region to bring 905,000 hectares under irrigation by 1998 in order to increase food and agricultural production. Irrigated land will be developed mainly in Senegal and Mauritania where the construction of the Manatali dam on the Senegal River will make possible the irrigation of 400,000 ha (11). Another 300,000 ha are expected to be developed in Mali in the Niger River Valley. In the North African region where there is already a tradition with irrigated agriculture (Egypt and the Sudan) it is planned to bring an additional 2 million hectares under irrigation in the Nile Valley to meet the food needs of the growing populations. It is expected also that in the upstream countries of the Nile Valley some 400,000 ha will be brought under irrigation to augment food production in Uganda, Tanzania and Kenya.

26. The economic viability of modern irrigation schemes continue to be constrained by high costs of construction, operation and maintenance and by poor production performance leading to a low overall profitability of irrigation. (12) In view of these experiences it is necessary for each country to critically review the role irrigation should play in its food and agricultural production strategies having regard to its climate, land, water and human resources.

27. Over the whole of the region, it is anticipated that provided reasonable progress can be made in bringing about fundamental changes and that adequate external support will be forthcoming up

to the year 2010, (6); (a) modern schemes will be developed at an average rate of 50,000 hectares per year; (b) rehabilitation of existing schemes will be at 25,000 hectares per year; and (c) expansion of traditional and small-scale irrigation areas at 150,000 hectares per year. It is apparent from recent trends in funding that these rates will have to be revised downwards.

28. To advance agricultural development, FAO has prepared an "International Action Programme on Water and Sustainable Agricultural Development (IAP-WASAD)" as a strategy for the implementation of the MPAP for the 1990s. (13) The IAP-WASAD identifies five priority areas for action to realize sustainable agricultural development with special reference to water use. The priority areas of action include: (i) efficient water use at the farm level; (ii) water logging, salinity and drainage control; (iii) water quality management; (iv) small-scale water programmes; and (v) scarce water resources development. The five areas require common actions consisting of: development of adequate data bases, adaptive research, institutional strengthening, human resources development, environmental protection and technology transfer, and infrastructure development. The objective of the IAP-WASAD is to inject a new momentum to rekindle the spirit of Mar del Plata with a new commitment for its implementation during the 1990s. The actions proposed under the IAP-WASAD constitute a 10-year programme which will contribute to agricultural development in Africa through optimum use of water and associated natural resources. The proposed programme will help increase the capacity of the organizations of the United Nations system to act as catalysts and to assist in a concerted manner in the formulation of policies and programmes and in the implementation of field projects.

C. Water resources assessment

Review of activities and appraisal

29. The first recommendation of the MPAP stressed on the need for greater knowledge about the quantity and quality of surface and ground-water resources, and for their monitoring to guide the management of those resources. UNESCO and WMO under the International Hydrological Programme (IHP) and Operational Hydrological Programme (OHP) have respectively devoted special projects for Africa towards the scientific and operational aspects of water resources assessment. Donor agencies (like CIDA, SIDA and USAID) have under various projects helped some African countries to strengthen their water resources assessment activities with training, equipment and field and laboratory facilities. Unfortunately, the meteorological and hydrological services which are responsible for basic water resources assessment activities have suffered serious deterioration in the past 10 years or so due partly to inadequate funds being made available to them. Assistances have been provided by multilateral agencies like the UNDP and the World Bank with WMO, UNESCO, FAO or DTCD as executing agencies. Unfortunately these efforts have been allowed to run down because national governments could not operate and maintain the systems effectively.

30. During 1970-1976 and again in the early 1980s, there was an improvement in general as regards large-scale water balance studies, water resources maps, including ground-water, and the statistical analysis of rainfall and streamflow. The importance of sediment and water quality observations is recognized, but network development and operation are hampered by lack of equipment, logistic support and laboratory facilities. Ground-water data collection networks are found mostly in areas of urgent water demand, such as large cities and irrigation schemes, but not all countries have appreciated the need for systematic monitoring of the resource.

31. Efforts for the assessment of sources of pollution and measures for preventing or limiting the degradation of water quality are not generally applied. At the same time the problem of pollution from domestic, industrial and agricultural sources has been growing. Several countries are faced with problems of bacteriological and contaminating, organic waste loadings, suspended solids and nitrates pollutants. There is a threat of increased problems from intensified agriculture and the associated increase in fertilizer and pesticide uses. Many of the shallow ground-water resources appear to be contaminated by pathogenic agents, largely from faecal sources, and there is absence of systematic water quality monitoring. (14)

32. Within UNESCO's IHP there are programmes directed to identify gaps and weaknesses and to initiate research in surface and ground-water availability in arid and semi-arid areas of Africa. There is also a special purpose programme to consider hydrological and water management problems and issues expected to arise in the humid tropics due to population increase which is expected to be 6.2 billion by 2000 with 50 per cent located in the tropics, almost all of which are developing countries. The full implementation of these programmes presented in the reports of a Seminar (15) and Colloquium (16) should lead to a better assessment of the water resources in both the water deficit and water surplus areas of the continent.

33. Another project within the framework of the IHP, is FREND (Flow Regimes from Experimental and Network Data) which aims to use the results obtained from representative and experimental basins in Africa to monitor natural and man-made changes in hydrological regimes. UNESCO and WMO have made efforts to introduce to the Hydrological Services in Africa the methodology contained in the handbook on Evaluation of National Water Resources Assessment Activities. (17) The handbook will enable countries to evaluate their activities and recommend measures for filling gaps and strengthening their services in the areas of: (i) institutional framework for water resources assessment; (ii) data collection, processing, storage and retrieval; (iii) areal assessment of water balance components; (iv) data for water resources planning; (v) manpower, education and training; and (vi) research. In 1987 the World Bank also started almost a similar project with UNDP funding under the Sub-Saharan Africa Hydrological Assessment Project. (18) These projects will help in the improvement of knowledge and better acquisition of water resources data.

34. Within the framework of the Operational Hydrology Programme of WMO the Regional Association I (AFRICA) Working Group on Hydrology held its fifth session in Conakry in November 1988. (19) The meeting reviewed among other things national reports dealing with various aspects of water resources assessment activities. It also considered reports by two subregional centres - CIEH and AGRHYMET - which are based in Ouagadougou (Burkina Faso) and Niamey (Niger) respectively. Further, the reports of Rapporteurs which assigned various tasks on operational hydrology problems such as hydrological networks, hydrological forecasting, water quality and sediment transport measurements and hydrological data and services, were reviewed.

35. On ground water in Africa UNESCO and OAU are funding the preparation of hydrologeological maps of Africa. DTCD in 1988 issued reports on groundwater development for individual countries in Africa. An extensive use of ground water in the Nubian Sandstone in Egypt, the Sudan, and Libyan Arab Jamahiriya is made for drinking water supply, livestock watering and extensive irrigation particularly in Egypt. Libya is currently engaged in a colossal ground-water development project known as the Great Man-made River for various sectoral uses.

Current trends and outlook

36. The current trends and outlooks for the 1990s show that: (i) there is a strong need for co-ordination and appropriate legislation; (ii) as regards the data collection activities, the current deterioration of the networks will worsen in the 1990s, if resource allocation to the Hydrological Services are not increased to operate and maintain what has already been established. The availability of finance or lack of it will similarly have its effect on areal assessment, on data and information for planning as well as research and development; (iii) that in many countries the brain drain of trained and experienced staff is likely to continue unless salaries, wages and other conditions of service are considerably improved.

D. Shared water resources

Review and appraisal

37. On shared water resources the United Nations Water Conference recommended that action should be taken to generate data on which future management could be based and to develop institutions and understandings for multi-purpose developments that are socially, environmentally and economically sustainable. It is recognized that the drainage basin provides a unique geographical entity to manage the interrelated and crucial resources of climate, water, land including vegetation cover, animal, aquatic and human resources.

38. Africa's general record in the process of development and conservation of the resources of international river basins depicts that the anticipated results are not achieved. There are many reasons for this shortfalls. Essentially the few existing basin organizations like Chad, Gambia, Senegal, Niger and Kagera have been subjected to various constraints, some for physical and climatic reasons, others tied to socio-cultural characteristics and the priorities of national economies. These later being reflected in financial, manpower and institutional limitations and problems of management and in finding technologies suited to their specific conditions. The second and equally important reason relates to the failure to apply the concept of multi-purpose planning. There has been over-emphasis on hydro-power development for urban, commercial and industrial uses at the expense of resilient ecology, human population and agricultural potential including livestock, forestry and fisheries. Most of the organizations started out with ambitious programmes that demanded huge capital outlays. Invariably River Basin planning has been the prerogative of most energy and irrigation agencies and this needs to have a new perception to encompass all other aspects of economic and social significance.

39. The experiences and lessons learnt by the existing river and Lake Basin organizations have been useful because almost all of these organizations are effecting significant transformation often resulting in structural reduction, with their major focus to basin planning, and identification of programmes which benefit member States. Cautious steps are being taken to keep programmes to manageable sizes. Close attention is also being given to choose executive heads on the basis of technical and managerial merits rather than on purely political grounds. Consequently the organizations are regaining the confidence and the political will and financial support of their member countries.

40. While action should be taken to initiate co-operative development, this must emerge from each participating State with a clear recognition that international development represents the best means of achieving national objectives. Such recognition cannot be achieved unless the States have the capability to assess their own domestic alternatives against the international alternatives. National planning institutions must then be capable of carrying out that assessment and thus international assistance should be directed at strengthening the national planning efforts.

E. Floods, droughts, and environmental degradation

Floods

41. Water resources is a very vital ingredient in national and regional development perspectives. Its control and conservation are necessary not only for development purposes but also to avoid the ravages that could disrupt normal life by floods, droughts and other environmental degradation.

42. There are many parts in Africa subjected to floods like the low-lying areas around the bank of Niger River in Mali which cause damage to crops, homesteads and cattle. There are recurring floods in Western Kenya as the Nyando overflows its banks and outflanking of the bridges upstream. The unregulated catchment of Shire in Malawi produces peak floods in the wet season sometimes with catastrophic consequences. Tanzania had experienced floods from rivers like Rufiji, Wami, Maragarazi and others. These were but a few examples of the incidences and of damages caused by floods. The problem exists in a number of other countries in Africa. In some irrigation projects, it becomes necessary to ensure flood protection. Examples are Tokar and Gash projects in the Sudan, Ambalbe project in Madagascar, Johar in Somalia and projects in Gabon and Nigeria.

43. In 1988 there were serious floods in Kenya, Nigeria, Gabon, and the Sudan leading to loss of life and dislocation of economic activities. In fact after the drought, these floods called for another form of emergency relief assistance as was demonstrated in the case of the Sudanese floods. In 1989 floods occurred in West Africa (Mali, Senegal and Ghana). The flooding which occurred with the recovery of the rains, continued in 1989 and 1990. Between February 1989 and September 1990, life has been devastated by four floods in Algeria and Tunisia; six in Djibouti, Somalia, Ethiopia and the Sudan; 11 in Mozambique, Zambia, Malawi, the United Republic of Tanzania, and Kenya and one in Madagascar. The devastation ranged from loss of 52 lives in Tanzania; 100,000 and 400,000 being homeless in Malawi and Ethiopia/Sudan respectively; to widespread crops destruction.

44. Flood poses difficult problems in many countries of the African region. This underlines the necessity for incorporating protection and control of floods in any scheme in the context of water resources development planning. It is also necessary for attention to be given to both structural and non-structural measures such as flood warning and forecasting systems to mitigate damages.

Droughts

45. The most recent experience of a severe and devastating drought with wide geographical distribution was that in 1981-1984. At its height in 1984, the drought affected 20 countries and some 30 million people in sub-Saharan Africa. It claimed numerous human and animal lives and left millions who survived in destitute conditions. For many countries it meant being economically crippled and sliding down in development.

46. It is known, that drought is a recurrent phenomenon and similar droughts in Africa have occurred in the 1940s, the 1910s, the early 19th Century and the mid-18th Century. Although there is no clear evidence of its periodicities, there is a speculation that the downward trend in rainfall may continue, relieved by periods of wetter-than-average rainfall. In Africa, the areas with high risk are those with failure of seasonal rainfall and those that are vulnerable to human and animal pressures such as the Sahel and semi-arid regions of Southern Africa. It is therefore necessary to take effective soil and water conservation measures in these regions.

47. During the drought in the 1980s, many countries established emergency relief bodies to co-ordinate the delivery of assistance to combat or mitigate the effects of the drought. It is necessary that governments do not disband these bodies with the end of the emergency. Rather, they should be made to handle in addition to drought, other calamities like floods, earthquake and man-made hazards. The emergency institutions under new structures will have to monitor the weather situation and other phenomena (which lead to hazard) and be ready with contingency plans to respond to these emergencies.

Environmental degradation

48. In high rainfall, high productivity zones, increasing land pressure and fragmentation of land holdings have resulted in fertility decline. In low-rainfall and drought-prone areas, over-grazing and shifting cultivation on increasingly marginal lands continue to undermine the already fragile ecological balance. Over the past two decades, Africa's semi-arid lands have come under pressure by people and livestock at a rate considerably faster than the more fertile areas. Consequently, conditions of hunger, and even famine are increasingly common in these areas as is the occurrence of drought. This sets in train endemic poverty - poverty of land, and resources to continue. The continuing depletion of forest cover in search of cultivable land and/or fuelwood by the poor make the agro-pastoralists and herdsmen appear as both perpetrators and victims of this phenomenon. A root cause of deterioration in most countries of Africa is the struggle for survival since poverty, environmental degradation and population growth interact in the dynamics of the chain process. At present there is a deficit of fuelwood supply in North Africa and sub-humid and mountainous East African countries of 28.5 million cubic metres. This deficit is expected to increase to 309 million cubic metres to cover all the countries of the region with the exception of those in the humid Central African subregion by the year 2010. (6)

Activities in progress

49. As part of the efforts to conserve vegetation, various forms of renewable energy sources are being promoted at the country, subregional, and regional levels. For instance, tree planting is being promoted in the countries of the Sahel region, Botswana, Tanzania, Burkina Faso, Ghana, the Sudan, Ethiopia and Kenya. Also, agro-forestry which will enable food and agricultural production to be carried out and at the same time enable trees to be grown for fuel and other uses is being promoted in a number of other countries. In 1989, Nigeria has been granted Ecu 9.4 m under the Lome II Convention to support an afforestation project in Katsina State in the north of the country. In Burkina Faso villagers have developed a technique which uses stones to arrest soil erosion and conserve water for crop production. The village of Doblo with about 7000 inhabitants have used the technique to increase yields considerably. In the Sahel countries dune fixation and the planting of shelter belts are among the techniques being used to check the encroachment of the Sahara desert.

Energy conservation measures through the use of improved stoves that prevent loss of heat during cooking are also being promoted in countries in the Sahel, Kenya, Tanzania and Ghana. Research and development in the use of solar energy is another activity being encouraged. Leading in this field is the ECA-sponsored African Regional Centre for Solar Energy based in Bujumbura and the EEC-sponsored Centre Regionale de Energie Solaire based in Niamey. These institutions need to be strengthened so as to be more effective. Action should also go to encourage the use of other sources of energy including crop and animal residues and industrial wastes like saw dust, etc.

50. Following the recommendations of the African Ministerial Conference on Environment held in Cairo in December 1985, a River and Lake Basin Committee has been established. It is to ensure that environmental concerns are taken care of in the development of river basins. The main mechanism for promoting this is UNEP's recommended approach of Environmentally Sound Management of River and Lake Basins. Secondly the Water Resources networks consisting of national focal points and a Regional Co-ordinating Unit located in Cairo was established in 1988, following preliminary meetings in 1987. (20) It will co-ordinate and enhance exchange information and experiences for development of water resources in an environmentally sound manner. Thirdly in 1988 the establishment of village Pilot and Stock Raising Projects in a number countries were started. Food, energy and livestock production will be tried on a sustainable basis in these project areas, and the results replicated in other parts of the continent.

51. Early Warning Systems are being established in the countries of the region with the assistance of FAO, whereby data on agro-meteorological parameters are collected, analysed and the information disseminated to farmers to help them plan their food and agricultural production activities more effectively. Significant progress has been made in about 30 countries to establish these systems in the ministries of agriculture with the co-operation of the national meteorological services.

52. Following the drought of the 1980s, the ECA Conference of Ministers took a decision in 1985, to establish the African Centre of Meteorological Application for Development (ACMAD). (21) The objective of the Centre is to contribute to the socio-economic development of the African countries, through the use of meteoro-logical products and the creation of a new meteorological assistance system in Africa with a view to mitigating the effects of droughts, floods and cyclones, promoting knowledge of weather and climate and conserving natural resources.

53. In May 1989, governmental agencies and representatives of local communities in the CILSS countries of the Sahel met and agreed on the framework for future action consisting of: (22), (i) ecological rehabilitation to restore the degraded land asset; (ii) local level natural resources management in which responsibility will be shared with local communities; (iii) decentralized management to increase efficiency; (iv) land tenure reform to encourage local investments; (v) local credit and savings to increase local investment; (vi) women's participation to ensure the success of projects; (vii) information and training to share experiences; (viii) population control and development with the aim of improving the future. The three actors, viz. local communities, government agencies and the donors, agreed that they needed to work together in partnership for success to be achieved, and that none could go it alone.

54. The African Regional Conference on Environment and Sustainable Development in Uganda in June 1989 adopted strategies for restructuring the current structure of national economic production (23) and called for special attention to the rural sector with focus on: managing

demographic change and pressure; achieving food self-sufficiency and food security; encouraging efficient and equitable use of water resources; securing greater energy self-sufficiency; optimizing industrial production; maintaining species and ecosystems, and preventing and reversing desertification.

55. The World Bank is also offering assistance to countries to prepare National Environmental Action Plans. There is also a project under the World Climate Programme-Water, which is a study of the impact of climate variation and expected change from the "Green house" effect and other man-made activities that was started in the African region in 1988.

56. The World Commission on Environment and Development noted that mankind faces a threatened future because of inadequate environmental management and recommended that emphasis should be placed on planning for sustainable development which should be applied to sectoral ministries whose activities cause environmental damage. To this end emphasis must be placed on policies that would ensure the participation in an integrated manner of all sectors of development in environmental conservation. Appropriate policies and administrative instruments must therefore be developed that will cater for the needs of present and future generation.

F. Institutional and legal infrastructures for planning and management of water resources

Actions proposed and progress made

57. The ultimate goal of the MPAP was to bring about a better economic and social progress through accelerated development of water resources. The realization of this goal was foreseen to be achieved by means of appropriate institutional and legal infrastructures set up for orderly administration, planning and management of water resources. It emphasized co-ordination among all institutions responsible for water affairs and that each country would review existing legislation to enhance co-ordinated planning.

58. To improve the situation, some countries carried out institutional and legal reforms either on their own or forced by circumstances to effect changes. The result of these efforts is that some countries have strengthened the existing institutions, others created new ones like central policy-making and co-ordinating bodies and semi-autonomous public agencies; others have reassigned functions among institutions and still others have reassigned ministerial responsibilities for water agencies.

59. An assessment by ECA in November 1983 carried out on the basis of a questionnaire survey to which 22 countries responded showed that 14 countries had national water policies, only 2 had prepared Master Plans, while 16 were organizing to prepare such plans. Seventeen countries reported to have co-ordinating bodies, and only 5 were satisfied with the adequacy of their existing legislations.

Regional evaluation of institutional and legal infrastructures

60. The most recent study conducted by DTCD/DIESA in 1990 on institutional and legal infrastructures (24) reports that the recurring infrastructures existing today at the national level are many, but that a critical look reveals four main types. These are said to be characterized by the kind

of overall water policy- making or co-ordinating body that has emerged. Variations exist within each type but the main ones that can be identified are as follows:

(a) Type I: Within this institutional infrastructure, policy continues to be fragmented in various ministries dealing with water and expressed in legal enactments or administrative directives of agencies operating under these ministries. Examples of this type are in Ghana, Sierra Leone and in others;

(b) Type II: Within this institutional infrastructure, there is an overall water policy or co-ordinating body in the form of Water Resources Commission/Board. The other agencies be they autonomous, public corporations or departments of ministries are subordinate in one form or another to the Commission/Board. Ethiopia provides such an example;

(c) Type III: In this type of infrastructure there is an overall policy- making and co-ordinating body for water under a Ministry which has other responsibilities apart from water. The Ministry of Water Resources, Forestry, and Fisheries as in the Gambia is an example. Others are in Uganda, Zambia and Malawi.

(d) Type IV: In this type, a ministry solely for water resources has been set up to direct the policy for planning and management of water resources. Examples are Burkina Faso, Kenya and Nigeria.

61. In spite of the continuous efforts the countries are making to restructure their institutions and strengthen their laws, several problems still persist. It is noted that many countries have still not established, overall policy-making and co-ordinating bodies for giving central direction to water resources utilization conservation. Further, because of its ubiquitous nature, water responsibilities are divided among a number of ministries or departments and the functions overlap or have duplicity. So far only a few countries have key legislations covering water rights, and control of waste/effluent discharges and land degradation. In most countries linkages among agencies and sector ministries are weak, due to weak planning units at the agency and sector levels. While there appears to exist capabilities for planning at the national economic development (macro) level, the capabilities at the sector and project levels are weak. This arises mainly from inadequately trained staff and lack of opportunity to practise. This is mainly because sector and project level planning for which countries invariably seek external assistance, go to outside consultants, as a condition for giving aid. Apart from the use of the tariff structure, most demand management mechanisms are weak because of lack of rules and regulations for allocating water to users. It is noted that although the need for cost recovery is now realized, the situation is unsatisfactory in water supply, sanitation and irrigation sub-sectors. The issue has been politicized in almost every country and most governments are caught in very difficult situations between the need and the possibilities. Lack of inadequate funds which together with lack of trained personnel has resulted in unsatisfactory operation and maintenance of water supply and sanitation systems in most countries. The lack of key legislations in several countries continues to undermine effective environmental protection of surface and ground-waters. It is also noted that the mechanism for integrated multipurpose development of river basins as a basis for socio-economic development remains undefined in almost all countries. The question of explicitly identifying by the countries, of the agencies that should represent them on studies and development of water resources they share with neighbouring other states is still outstanding.

Outlook

62. The weakness in institutional infrastructure due to inadequate policies and legislations to guide the multi-dimensional aspects of water resources and its consequence in poor management and proliferation of authorities and duplication of efforts continue to undermine implementation of water resources development programmes. The strengthening of water development institutions including the adequacy of policies and planning is indispensable for development in the 1990s. The priority target for the future must be on building up national capabilities for proper planning, execution and management of water development programmes.

G. Water sector planning

63. The weaknesses which had attended the preparation and implementation of national water master plans in the early years of the MPAP have continued to persist. They relate to insufficient cross-sectoral harmonization, and reconciliation with the national development targets at the macro-economic level. The result is that the projects selected from perspective water sector plans to form the water programmes of the three- or five-year National Development Plans are too ambitious without national absorptive capacity to handle them.

64. In the past few years, attempts to correct the ills of the economies of a number of African countries, through Structural Adjustment Programmes (SAP) of the IMF and the World Bank have provided an indirect opportunity to deal with some of the weaknesses of the water sector plans. Among the measures of the SAP are the arresting of the balance-of-payment deficits, and the pruning down of government expenditures to levels that can be sustained by resources. Consequently the water sector like the other sectors is being reviewed in terms of objectives, targets, plans and resources in order to determine what can be funded having regard to the national resources and investment funds that can be expected from external sources. This has resulted in a number of water development plans being scaled down. The area of project preparation at the micro-level continues to be another weak area in planning. Again the SAP and the consultative meetings are helping to bring about improvements.

H. Mobilization of financial resources

65. The implementation of Structural Adjustment Programmes by most countries in the region to correct their economic problems continued. These invariably have resulted in cuts in government expenditures. The implication is that new projects are either delayed or cannot take off, and existing systems are running down because of inadequate maintenance. On the external side, the United Nations system of organizations increased their disbursements from $31 million in 1973 to $184 million in 1985. (25) This represented an annual rate of growth of 16.9 per cent over the period. The highest rate of growth was in Africa, Asia and the Pacific. The lion's share of the disbursement went to drinking water supply and sanitation (50 per cent) followed by irrigation (24 per cent).

66. With regard to loans and credits from the World Bank, International Development Association (IDA), and the International Fund for Agricultural Development (IFAD) total funding for water projects increased from $504 million in 1976 to $1,748 million in 1985. Of the total disbursements of $10,956 million over the 1976-1985 period 54.6 per cent went to agriculture, 28.7

per cent went to drinking water supply and sanitation, 15.4 per cent to hydropower and 1.3 per cent to navigation.

67. Loans and credits to African countries for irrigation projects were more to countries north of the Sahara than to countries south of the Sahara because of the less viable nature of irrigated agriculture in the south. In the area of drinking water supply disbursements to Africa were more to urban water supply and sanitation projects in countries where sufficient financial returns could be generated (e.g. Côte d'Ivoire, Kenya and Nigeria) than to rural areas where the socio-economic viability and cost recovery were questionable. The United Nations study concluded that globally, in spite of the increase in disbursements from the international community, the levels of achievement are much below what was estimated at the time of the United Nations Water Conference.

68. It is obvious that the ability of African Governments to increase their investment in the water sector cannot be expected to improve in the near future in view of the current political development in the world and the prevailing economic difficulties and the structural adjustment programmes which they are going through. It is therefore necessary that governments begin to implement a gradual but determined policy of cost recovery in the water sector.

I. Human resources development

69. The level of undergraduate courses in the countries is most important for the many and varied specialized human resources requirement. Unfortunately this is threatened, because of dwindling resources being made to the universities. This is partly to be blamed on the structural adjustment programmes which call for cuts in government recurrent and capital spending. It could be said that the problem even goes deeper as the first and second cycle institutions have equally been affected.

70. There is no doubt that spending on education is highest in almost every country in the region. (26) In 1981 and 1982, 20 per cent of the recurrent expenditure in the region was spent on education. This started to fall in 1983 and except for a brief recovery in 1985 it went down to 9.9 per cent of the expenditure in 1988. The impact of this is reflected on the school enrolment rate in the region. For the first cycle level (primary education) the annual growth rate of enrolment of 7.3 per cent which was recorded in 1970-1980 fell to 2.6 per cent over the period 1980-1987. For the secondary levels the enrolment growth rate over the same period fell from 11.9 per cent to 8.5 per cent and for the tertiary or university level the growth rate fell from 13.1 per cent to 7.7 per cent. The trend does not augur well for human resources development at the professional and technician levels in water resources and other specialities.

71. One of the most urgent training needs to which attention should be directed is in project planning and preparation at the micro-economic level, water resources sector planning and their relation to national development planning at macro-economic level. There are some post-graduate training programmes by UNESCO that provide an avenue to improve the human resources situation at the regional level. The Universities of Dar es Salaam and Burkina Faso also provide regional training courses. For technical training countries like Nigeria, the United Republic of Tanzania and Zambia have well-established schools, others like Ghana operate ad hoc training schools attached to hydrological and meteorological services or water supply agencies. The question of maintaining a continuous stream of students may has problems because of limited employment opportunities. This could be overcome by adopting the Nigerian, Ethiopian or Tanzanian approach where instead of

establishing a number of schools one national school can be established to train technicians for all water agency needs and with flexibility to respond to demands. At the informal level the mass literacy programmes have shown good results in many countries and this should continue to educate local people in various matters affecting them so as to mobilize and assure their intensified participation.

III. STRATEGY AND AREAS FOR ACTION IN THE 1990s

Key issues and problems

72. Africa is a region exhibiting complex patterns and striking paradoxes of climate, physiography, economy, social, cultural and political features. The countries of the region are at different levels of development. Given such circumstances, it would neither be possible nor desirable to encompass the national water development strategy in any single comprehensive model. What is obviously wanting is new approaches and strategies to guide the future courses of actions.

73. Water activities are often split between a number of ministries. This fragmentation of responsibilities among sectoral ministries and administrative agencies have hindered co-ordination and impeded the attempts to integrate water management activities.

74. The question of maintaining equilibrium on the extent of centralization or decentralization of responsibilities being left for local and national adaptation, there has been a generally successful trend towards designation of some national focal point, or centre with responsibility for the management of water resources. Another useful instrument to assist in the implementation of multi-sectoral programmes which many countries are adopting as the basic planning unit is the hydrologic geographical unit or the river basin unit.

75. Water use efficiency is a subject of concern to a large majority of countries and relates to all sectors, as it sets excessive demand on the resource itself and implies increased investment in infrastructures and operational costs. This has been observed in the occurrence of excessive linkages reported in the distribution systems of many countries in Africa. The problem is of particular significance in agriculture and more so in irrigation which has a heavy demand for water. For many countries in Africa where irrigation is increasingly gaining prominence, the overall rational use of water is key to development. Demand management particularly in North African countries (where irrigation is relatively developed) even if it gives only marginal savings of water could have profound benefits, in the large volumes it releases and in avoiding costs for exploration and development of additional sources.

76. Recently, more and more countries in Africa are embarking upon irrigated agriculture. There are also countries in North Africa which have longer history of irrigation and had experiences of salination which damage soil property. This latter group of countries need to provide in their national strategy a component to combat the threat and to bring about sustainability and increase production potentials. For those countries newly embarking on irrigated agriculture, the incorporation of drainage facilities will be a cost-effective investment. Where appropriate, irrigation development and expansion should take into consideration the possibilities of adopting necessary design and operational factors to incorporate marginal quality of water from effluent or brackish sources into existing and future schemes.

77. Africa most recently suffered from the Great Droughts of 1981-1984. Currently the speculations are that the downward trend in rainfall may continue and set in train the process of accelerated desertification and drought at the same time increasing the frequency of its occurrence. The concept of "drought proofing", reflecting concern over possible climatic changes, is becoming an integral part of planning with increased water conservation measures and crop diversification.

78. There has been a growing concern in many countries of Africa for the control and mitigation of flood damages and associated disasters. Whereas the causes of flood may be varied, there are strong linkages between land management in upper catchments, land-use policies in flood-prone areas, the costs of flood damages and of its prevention. This obviously places the subject within many national water strategies.

79. Closely linked to the economic difficulties which several countries in Africa are going through is a common problem of maintaining water systems in a state, matching design criteria and meeting operational and efficiency requirements. This applies to all sectors. Emphasis on rehabilitation of inefficient systems, reduction in wastage and unaccounted for water, recycling and reuse of waste water, and improved operation and maintenance can be more cost-effective approaches than investment in new services.

80. The provision and expansion of domestic and municipal water supplies, together with hygiene education is considered to be one of the contributors to the social well being of a community. To be fruitful, this should be accompanied and matched by complementary services for effluent treatment and disposal particularly in the urban centres in Africa where the problem is worsening. It has been noted that the overwhelming routine and continuing discharge of industrial wastes without treatment, and the entry of fertilizers and pesticides into surface and ground-water are expanding and intensifying the problem of degraded water quality. The efforts to monitor the situation have been minimal and even the measurement of quantitative hydrological factors are inadequate. On the other hand, the health of the people, and the health of the water bodies is being jeopardized demanding a major strategy that deals with the provision of sanitation and waste disposal and for measuring and monitoring the hydrological status and quality aspects of rivers, lakes and ground-water.

81. Water is a commodity to be paid for. The cost of providing water services to various user sectors must be met by the beneficiaries or by the community - and usually by a mix of the two. In applying the principle of cost recovery or a degree of financial autonomy in a scheme, two important points need consideration. The first is the guaranteeing of reliability of the supply system for users to accept the principle and secondly the ability to adjust charges to meet the costs of supply.

82. With the institutional and administrative changes that have been introduced to keep pace with water management, all countries are discovering the need to adapt their legislation to match more dynamic and more demanding circumstances. Inadequate legislation has often been a serious impediment to water development or its optimal use. Of equal importance to the formulation of enabling legislation is the need to establish mechanisms to enforce its provisions.

83. The dearth of adequate human resources, with training, skills and experience in the scientific, technical, managerial and administrative functions required for the development, conservation and management of water resources forms a crucial constraint in the strategy proposals of almost all the countries in the African region. Since the Water Conference, attention has been given to the

development of human resources and experience shows that the efforts must continue. It is worth noting that a promising trend is being developed in some countries towards a more positive involvement of local communities in the conservation and management of their natural resources and the environment. This mobilization of popular participation, with able organizers and appropriate information support, may offer a great opportunity for sustainable management of resources. A national campaign to stimulate such action could give a strong impetus to the implementation of the strategy at the country level.

84. The Water Conference represented a unique assembly of knowledge and experience in all water related fields. It provided a frame of reference which is still valid from which the present update does not fundamentally differ. However based on experiences unfolded since 1977, the following are identified as priority areas for action within the individual national water strategy for the 1990s.

Action at national level

85. The increasing population continues to set a heavy demand on land and other natural resources and induce conflicting and competing use on water because of changing needs. But so also has the environmental degradation continued its impact on sustainable socio-economic development as illustrated by the Kampala Declaration of June 1989, following the African Regional Conference on Environment and Sustainable Development. (24) A key issue to halt and reverse the environmental degradation, is the management of natural resources at the local level by maintaining linkages and interactions between the various actors. The fundamental philosophy upholds that the planet's resources are finite and the technological tools to exploit these resources are limited at any particular time. Therefore, basically the emphasis is on the management of land and water as finite resources and on the co-

ordination and integration of water, land-use, and population policies for sustainable development.

86. The weaknesses in the linkages between water sector planning and national planning at the macro-level and project planning at the micro-level persists. The Structural Adjustment Programme (SAP) which most countries in the region are implementing is putting pressure on them to appropriately relate the water plans with National Development Plans in view of SAP's requirement to balance the internal and external accounts. The essence of planning should be in integration of sectoral plans and programmes with overall water resources management within the framework of national socio-economic objectives. This is to be accompanied by the establishment of institutional and organizational arrangements, including an appropriate form of national water resources centre to facilitate this.

87. The meteorological and hydrological services have run down badly in the past ten years for various reasons particularly for lack of adequate funding. They are in urgent need of rehabilitation and expansion. The UNESCO/WMO National Evaluation of Water Resources Assessment activities and the UNDP/World Bank sub-Saharan Africa Hydrological Assessment identify actions that should be taken in each country. The improvement or, where necessary, the introduction of systematic measurement and monitoring of water quantity and quality, in both surface and ground-water sources is essential in the light of concerns regarding global atmospheric warming, and the increasing demand on the resource.

88. As a result of the debt burden and the economic difficulties of the African countries, investment funds for water projects have diminished. Operation and maintenance funds have either been curtailed or removed under the Structural Adjustment Programme. The flow of external investment funds have been slowing down since 1983 partly as a result of the difficulties of meeting debt-service obligations. The problems call for:

(a) The development and introduction of practical measures towards scheme autonomy and cost recovery in conjunction with greater efficiency and reliability of water supply to the various users.

(b) Increased attention and investment in measures to improve water use efficiency and to reduce wastage, damage to natural resources, and the rehabilitation of infrastructures.

89. During the drought many countries lived through a cycle of austerity or contingency plans to the detriment of normal programmed work. The establishment of the Emergency Relief Organizations on a more permanent basis would curb the problem of diverting resources to meet crisis conditions and would enable to act in all kinds of disasters like floods, droughts and earthquakes, etc.

90. A strong emphasis lies in overall planning for drought conditions and water conservation in water scarce areas, and for the mitigation of flood damages.

91. The fluctuation in food and agricultural production due to meteorological variations persists. The most effective remedial measure aimed at contributing to stabilize production is the Early Warning System which is being installed in many countries. The present distribution and contribution of irrigation to food and agricultural production has not changed, as the region is still a net importer of cereals, the one crop to which 5s per cent of the land under irrigation is devoted. Current funding is going into rehabilitation and expansion of existing schemes. At the same time the economic viability of modern irrigation schemes is constrained by high costs of construction, operation and maintenance, and by poor production performance leading to low overall benefit of irrigation projects. Therefore critical review is needed of the role irrigation should play in the national strategies for food and agricultural production having regard to climate, land, water and human resources.

92. Urgent action needs to be taken to provide adequate waste water treatment disposal and reuse, to complement the expansion of water supply systems.

93. Redesign of legislation, and the mechanisms for its effective application are invaluable to meet present and future water management needs.

94. The share of education in the national recurrent budget has been falling since 1981. The regional average fell from 20 per cent in 1981 to 9.9 per cent in 1988. Subsequently the annual rate of growth of enrolment in the primary, secondary and tertiary levels have fallen over the 1980-1987 period as compared with the period 1970-1980. The current trends show that there is need for training in planning, project identification and preparation, project implementation, project monitoring and evaluation. A cost-effective way to train technicians on a continuous basis will be to set up training schools which can train technicians for the various subsectors of water.

95. The resources of the departments of community development, health and education need to be increased to enable them intensify their mass education campaigns at the local level and thereby secure the participation of local communities in the management and conservation of water resources, and to increase the awareness of the value of water among production sector users.

International support

96. the international community has been following closely and supporting activities geared to the use and development of water resources in Africa.

97. As regards community water supply, the International Drinking Water Supply and Sanitation Decade (IDWSSD) 1981-1990, has evolved a network of External Support Agencies (ESAs) with a Collaborative Council for the purpose of stimulating action in the sector. The Council brings together multilateral and bilateral agencies, banks, non-governmental organizations (NGOs) and members from developing countries. Of the water use sectors those for industrial and energy purposes are the ones that most attract necessary external support for their water developments from commercially-backed sources. Other development aspects of like drinking water and agriculture are generally subordinated to the user sectors. A very vital area in Africa where assistance is most needed is the domain of agriculture. For this sector an International Action Programme on Water and Sustainable Agricultural Development (IAP-WASAD), which proposes similar collaborative arrangements like that for drinking water, has been formulated by FAO, in co-operation with other organizations of the United Nations system, as a strategy for the implementation of the Mar del Plata Action Plan (MPAP) during the 1990s and beyond. These initiatives are in keeping with the growing concern of the poor performance of the agriculture sector during the last one and a half decades which did not measure up to expectations such that it required massive collaborative efforts to assist the developing countries.

98. The neglect of the management of water resources by the national and international community and the inadequate efforts towards the technical and managerial capacity-building for the development and conservation of water resources could partly explain the reasons for limited achievement in the realization of the MPAP, especially of its long-term objectives. In terms of the strategy, the definition of "the allocation of and development of resources in pursuit of an objective" which has not been responded to in the past, now need to be translated into action so that the "strategy for the 1990s" may be put into effect.

99. The establishment of a collaborative mechanism to maintain close linkages by means of strengthening the capacity for the management of water resources through the national co-ordinating bodies (National Water Resources Centres) and the corresponding regional and global arrangements and programmes in support of these efforts is central.

100. Within the United Nations system the co-ordination and co-operation being maintained by the ACC Inter-secretariat Group for Water Resources which has been instrumental will continue its activities. In particular, interagency efforts will be concentrated on agreed action programmes concerning water for sustainable agricultural development, water resources assessment, water quality, human resources development, and water resources management, based on the outcomes of the regional assessments carried out for the formulation of the proposed strategy for the 1990s.

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